# MANAGEMENT PLAN

Scientific Observation Hole (SOH) Program

under

Conservation District Use Permit (HA 12/20/85 - 1830)

Kaimu, Puna, Hawaii

TMK: 1-2-10:03

Hawaii Natural Energy Institute

University of Hawaii

November 1989

## SUMMARY

This document presents a management plan to support the scientific observation hole (SOH) program in the Kilauea middle east rift zone. The SOH is for scientific observation purposes only. The core hole will not be flow-tested or produced. The information to be gained from the SOH will provide an assessment of subsurface geological conditions, groundwater level and composition, temperature, drilling conditions, an inventory of possible mineral and geothermal resources, and an eruptive history of the island to the depth drilled.

The plan addresses the access, parking, drainage, fire protection, safety, signs, lighting provisions, and changes in landscape for review and approval.

## I. INTRODUCTION

The Department of Land and Natural Resources approved, on September 25, 1989, a request to drill a scientific observation hole (SOH 3) in the area (TMK 1-2-10:03) approved for geothermal development activities under Conservation District Use Permit (HA 12/20/85 - 1830) issued to the Estate of James Campbell. This document presents a management plan as required in Decision and Order, Plan of Operations, (b) management plan:

> "Applicant shall submit to DLNR for ministerial approval, a management plan relative to access, parking, drainage, fire protection, safety, signs, lighting provisions, and changes in the landscape, for review and approval.

## II. BACKGROUND

The SOH 3 is for scientific observation purposes only. The core hole will not be flow-tested or produced. The information to be gained from the SOH will provide an assessment of subsurface geological conditions, groundwater level and composition, temperature, drilling conditions, an inventory of possible mineral and geothermal resources, and an eruptive history of the island to the depth drilled. The SOH, in combination with existing geothermal wells or future geothermal wells to be drilled by producers, can be instrumented to provide data relating to reservoir productivity. By injecting water into the holes, estimates can be made as to possible reservoir conditions and productivity.

Mud drilling causes negligible gaseous emissions because the drilling mud forms a cake on the hole walls, sealing the hole from fluid entry. Also, the hydrostatic head of the drilling fluids tends to prevent fluid entry into the hole. The holes will be protected from blowouts during drilling by: using blowout prevention (BOP) equipment; cementing the casing to the rock formations; having water available to cool and quench the hole; and following standard drilling safety procedures. After drilling, the hole will be capped with a wellhead valve.

## III. ACCESS

SOH 3 is located on State Conservation District (TMK 1-2-10:03 por.) within the True/Mid-Pacific Geothermal Venture exploration/development area A of the Kilauea middle east rift zone, Puna district of the Big Island of Hawaii (see Figure 1).

The primary route to the project site will be via State Road 130 to the Pahoa bypass road north of Pahoa, to South Road to Kaohe Homesteads to Middle Road and south along State Road easement to the boundary of the Campbell Estate property (TMK 1-1-10:1). A gate is installed at the road entrance to the Campbell Estate property at the juncture of the State road easement and True/Mid-Pacific Geothermal Venture project site. Access to SOH 3 will be over the True/Mid-Pacific Geothermal Venture road to their wellsite 1. SOH 3 will be located in between True/Mid-Pacific Geothermal Venture's wellsite 1 and wellsite 2.

Access will be limited to SOH project personnel, regulatory government

officials, and other visitors admitted by project management. All non-project personnel admitted to the SOH project site will be escorted by project personnel.

## IV. PARKING

The drill site will cover approximately a quarter of an acre which will include drill pad, water storage, mud pit, storage area, sump pit, access road, and parking for drill site personnel and visitors. A limited parking area will be available for utility vehicles, project personnel, and visitors. Figure 2 shows a typical layout of the drill site area.

## V. DRAINAGE

As shown in Figures 2 and 3, all site drainage will be directed into the sump pit. Drilling fluids and excess mud as well as rainfall runoff will flow to this sump pit. After drilling, any existing material and/or fluid in the sump pit will disposed in a manner acceptable to the County of Hawaii and State Department of Health.

## VI. FIRE PROTECTION

All drill rigs will be equipped with fire extinguishers. Each core rig will have a mobile telephone located at site in the event of an emergency. Telephone numbers for police, fire department, hospital, and other emergency services will be posted at the telephone. In addition, the telephone numbers of the drill manager, principal investigator, project manager, and appropriate state and county regulators will be readily available.

## VII. SAFETY

A combination of rotary and core drilling methods will provide the maximum flexibility to handle the variety of anticipated drilling conditions.

Casing and cementing programs and blow out prevention (BOP) equipment to be used will provide protection from any potential over pressured zones and allow the hole to be shut in at any stage during the drilling after the upper 100 feet of conductor casing is in place. The BOP equipment will conform to or exceed specifications in Title 13, Chapter 183-74.

Even though, hydrogen sulfide emissions from core drilling with mud are extremely remote and that this core hole will not be flow-tested or produced, two hydrogen sulfide ($H_2S$) monitors with two-stage alarms and Scott air packs will be located on the drill rig. These monitors will have two-stage visual and sound alarm systems which will be triggered if $H_2S$ is emitted from the well. The detectors will be set at levels (warning at 5 ppm and alarm at 20 ppm) sufficient to protect rig personnel.

In addition, as part of the air quality monitoring plan, $H_2S$ measurements (in parts per billion) will be made with Houston-Atlas analyzers, along with wind speed and direction, on a continuous 24-hour basis for the duration of the core drilling.

All drill site personnel will be updated on first-aid and C.P.R. procedures, hydrogen sulfide ($H_2S$) alarm system and Scott air pack use.

Each core rig will have a mobile telephone located at site in the event of an emergency. Telephone numbers for police, fire department, hospital, and other emergency services will be posted at the telephone. In addition, the telephone numbers of the drill manager, principal investigator, project manager, and appropriate state and county regulators will be readily available.

## VIII. SIGNS

"No trespassing," hazardous warning and safety signs will be posted at applicable sites in the project area.

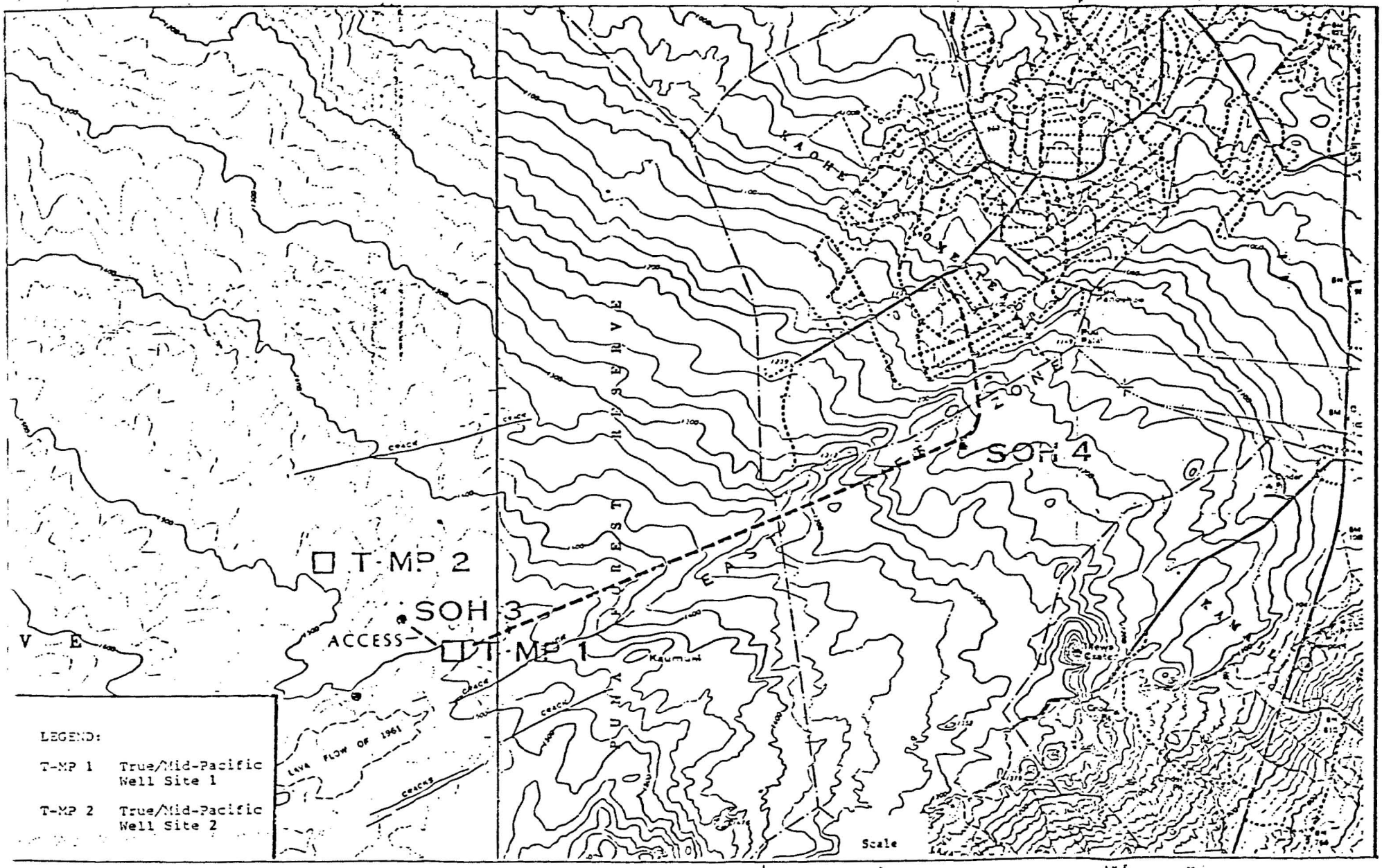
## IX. LIGHTING PROVISIONS

Lighting for night operations will be designed and arranged to assure that such operations can be performed safely and efficiently. Bright light requirements can generally be directed or sheltered to limit any impacts outside of the project area. Because of the isolation of the project area, it is unlikely that lights will disturb ant residential areas. Proper hazard lights will be installed on the top of the drill rig for aircraft that may fly over the project site. County of Hawaii outdoor lighting regulations will be in compliance at all times.

## X. CHANGES IN LANDSCAPE

The landscape will be altered in the area of SOH 3 due to clearing for the drill site. Approximately a quarter of an acre will be needed for core drilling operations. Metes and bounds descriptions, archaeological survey, and biological survey of the area to be cleared will be submitted to DLNR

prior to conducting any clearing operations.




- Figure 1. Location Map of SOH 3 -

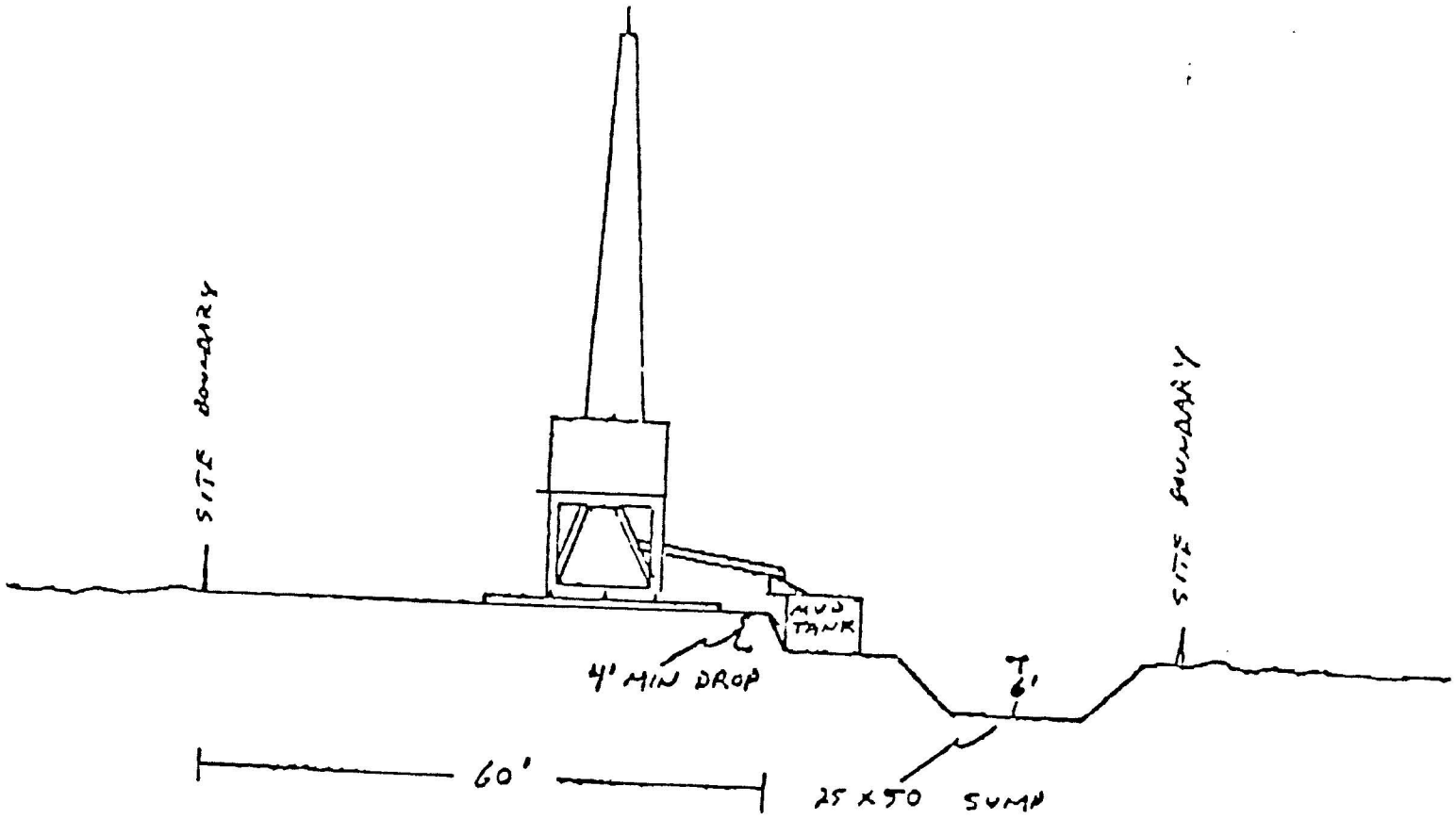



Figure 2. Typical SOH Site Profile

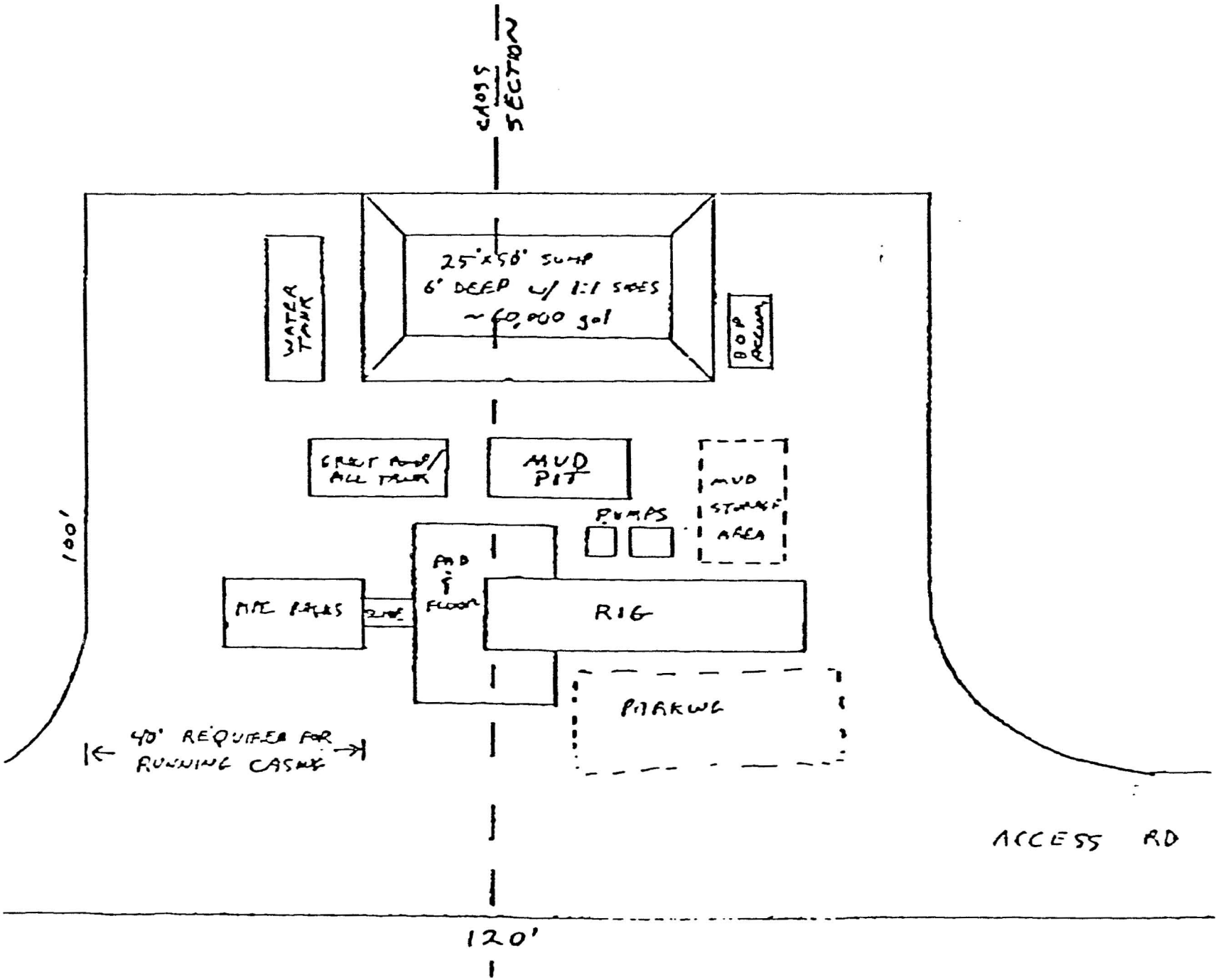



Figure 3. Typical SOH Site Layout

# MANAGEMENT PLAN - ADDENDUM

Scientific Observation Hole (SOH) Program

under

Conservation District Use Permit (HA 12/20/85 - 1830)

Kaimu, Puna, Hawaii

TMK: 1-2-10:03

Hawaii Natural Energy Institute

University of Hawaii

September 1990

## SUMMARY

This document presents an addendum to the management plan to support the scientific observation hole (SOH) program in the Kilauea middle east rift zone. The plan addresses the change in location of SOH 3 with respect to the original plan submitted in November 1989 for review and approval.

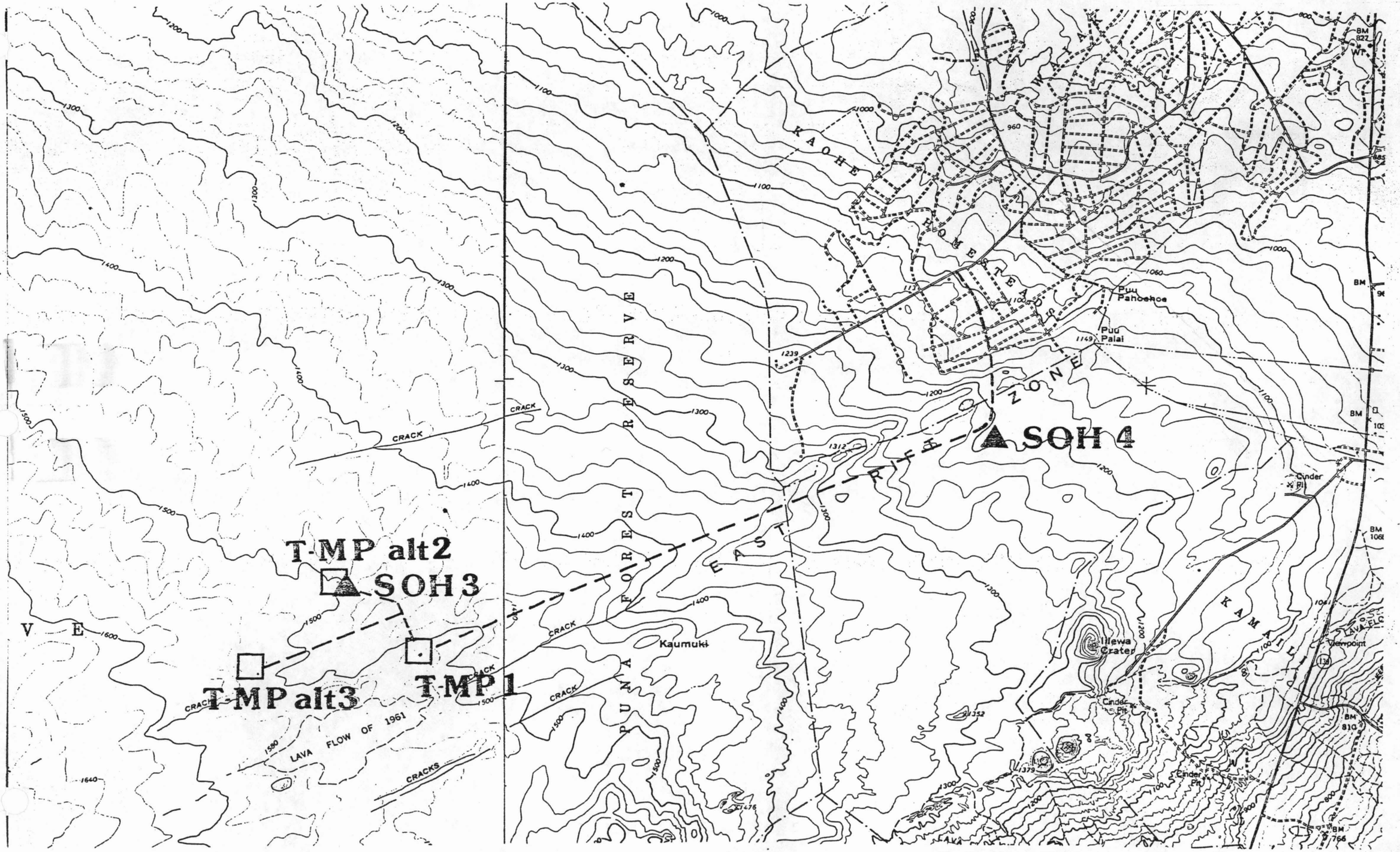
III. ACCESS

SOH 3 will be located on True/Mid-Pacific's alternate drill site No. 2, about 3,000 feet north-north-west of their present drill site No. 1 (See Figure 1).

X. CHANGES IN LANDSCAPE

A road approximately 3,000 feet in length will have to grubbed and graded from the existing drill site No. 1 to alternate drill site No. 2. Approximately a quarter of an acre will be needed for core drilling operations plus an access road surrounding the drilling operations. Metes and bounds descriptions along with biological and archaeological surveys will be submitted to DNLR.

— Figure SOH 3 Location —



# University of Hawaii at Manoa

**Hawaii Natural Energy Institute**
Holmes Hall 246 • 2540 Dole Street • Honolulu, Hawaii 96822


RECEIVED
DEC 1
WATER &
LAND DEVELOPMENT

November 30, 1989

Mr. Manabu Tagomori, Deputy
Division of Water and Land Development
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

Re: Scientific Observation Hole (SOH) Program Activities under Conservation District Use Permit (HA 12/20/85-1830)

Dear Manabu:

As part of the SOH approval conditions to drill and monitor SOH 3 under Conservation District Use Permit (HA 12/20/85-1830), we are submitting the following documents for your review and comment:

1. management plan;
2. air quality and meteorological plan;
3. noise monitoring plan; and
4. emergency plan (submitted to County of Hawaii Civil Defense for review).

The flora/fauna and archaeological surveys, along with the metes and bounds will be submitted once access to the proposed site becomes available.

If you have any questions, please feel free to call me at 522-5611, or in my absence, Arthur Seki at 948-8788. We thank you for support and assistance in our program.

Sincerely yours,

for Harry J. Olson
Hawaiian Electric Industries/
Spark Matsunaga Fellow in
Geothermal Energy Research

Enclosures

cc: D. Kanuha
A. Seki